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The proximity effect in an Fe-Cr-V-Cr-Fe system

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Abstract

The proximity effect was studied in a thin-film Fe-Cr-V-Cr-Fe layered system. As the chromium layer thickness (d(Cr)) increases at a fixed thickness of iron layers (d(Fe)), the dependence of the superconducting transition temperature (T(c)) on d(Cr) exhibits a maximum at d(Cr) ≃ 40 Å followed by a sharp decrease. Investigation of the dependence of T(c) on d(Fe) at a fixed d(Cr) showed that the depth of penetration of the Cooper pairs into a chromium layer does not exceed 40 Å. Analysis of the results obtained suggests that, at d(Cr) ≃ 40 Å, chromium layers exhibit the transition from a nonmagnetic state to an incommensurate spin density wave state. © 2004 MAIK "Nauka/Interperiodica".

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